

## **DAAC - SAGE III MOC Interface Confidence Test - ICT15**

The ECS at the LaRC DAAC and the LaRC SAGE III Science Computing Facility (SCF) work together with the LaRC SAGE III Mission Operations Center (MOC) to provide SAGE III science data products for the science community. The SAGE III instrument resides on board the Russian Space Agency's Meteor-3M spacecraft (scheduled to launch sometime in August of 1998). Because this is not an EOS spacecraft, flight operations for the mission are the responsibility of the SAGE III MOC.

The SAGE III MOC receives raw SAGE III instrument data from the NASA Wallops Flight Facility (WFF) tracking station, Wallops Island Virginia. The WFF is responsible for raw data capture, temporary archival, and data quality monitoring. The WFF electronically transfers the SAGE III raw instrument data to the SAGE III MOC for Level 0 data conversion. The Level 0 data is then distributed to the SAGE III Science Computing Facility (SCF) and to the LaRC ECS DAAC using the LaRC Campus LAN [25].

The SAGE III MOC automatically checks the Level 0 data to verify that instrument health, safety, and performance parameters are within established operating limits and performance metrics. The SAGE III MOC provides Level 0 data processing and definitive orbit services along with associated metadata generation. These products are made available to the LaRC ECS DAAC via a "Polling with Delivery Record" data transfer mechanism. The LaRC ECS DAAC ingests the SAGE III Level 0 data, Level 0 ancillary data, definitive orbit data, and metadata. The LaRC ECS SDPS segment provides a set of ingest, processing, archive, and distribution services for the science data. The LaRC ECS CSMS segment provides communications/networking services internally to ECS. The LaRC ECS generates SAGE III Level 1B and higher level products for the science community [26].

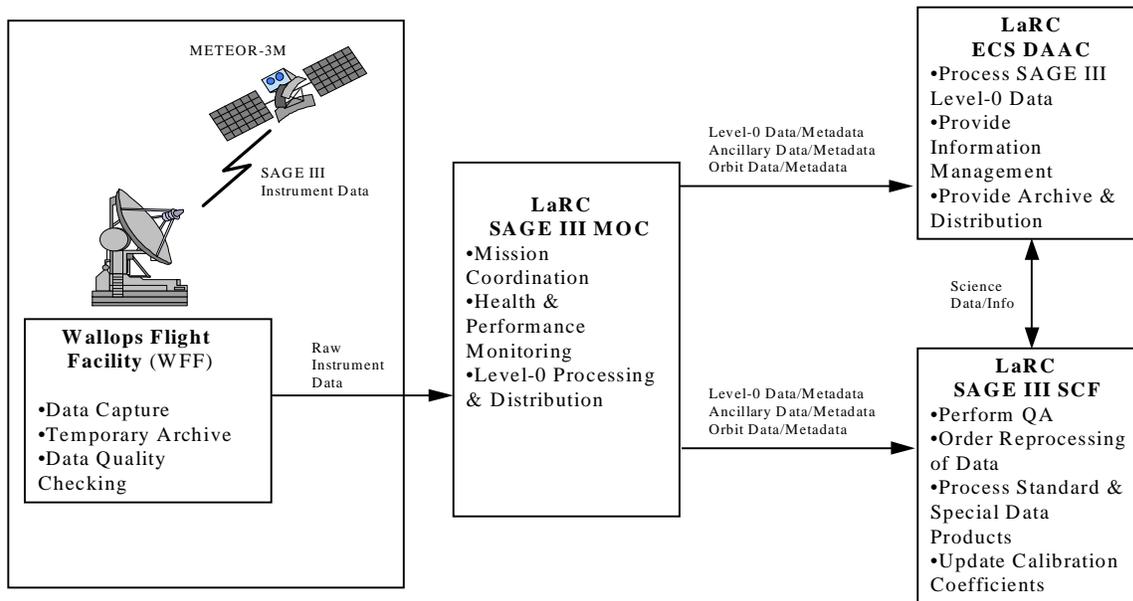
### Test Objectives:

The following is a summary of the test objectives:

- Verify the SAGE III MOC can provide and the LaRC DAAC ECS can receive notification of data availability
- Verify the SAGE III MOC can send and the LaRC ECS DAAC can receive SAGE III Level 0 data/metadata, Level 0 ancillary data/metadata, and definitive orbit data/metadata
- Verify the SAGE III MOC can interface with the LaRC ECS DAAC and the LaRC ECS DAAC can interface with the SAGE III MOC using authorization and authentication protocol
- Verify the LaRC ECS DAAC can provide and the SAGE III MOC can receive acknowledgment of receipt of file transfers
- Verify the LaRC ECS DAAC capacity to support the data volumes
- Verify the error handling capability during the course of data exchange between the SAGE III MOC and the LaRC DAAC ECS

Test Configuration:

Each site's hardware and software configurations are managed and tracked by their respective M&O organization. Prior to the start of testing, the test conductor obtains the current hardware and software configurations from each site and references these in the test report. Exhibit ICT15.1 [26] shows the SAGE III ground system test configuration. Exhibit 15.2 [26] shows the messages supporting data transfer and the SAGE III data types exchanged between the SAGE III MOC and the LaRC ECS DAAC.



**Exhibit 15.1. Meteor-3M/SAGE III Ground System Configuration.**

Source	Destination	Message	Data	Transfer Mechanism
SAGE III MOC	LaRC ECS DAAC	PDR1	N/A	FTP (get)
SAGE III MOC	LaRC ECS DAAC	PDR2	N/A	FTP (get)
SAGE III MOC	LaRC ECS DAAC	N/A	Level 0 Data w/Metadata	KFTP (get)
SAGE III MOC	LaRC ECS DAAC	N/A	Level 0 Ancillary w/Metadata	KFTP (get)
SAGE III MOC	LaRC ECS DAAC	N/A	Definitive Orbit Data w/Metadata	KFTP (push)
LaRC ECS DAAC	SAGE III MOC	Short PDRD	N/A	FTP (push)

Source	Destination	Message	Data	Transfer Mechanism
LaRC ECS DAAC	SAGE III MOC	Long PDRD	N/A	FTP (push)
LaRC ECS DAAC	SAGE III MOC	Short PAN	N/A	FTP (push)
LaRC ECS DAAC	SAGE III MOC	Long PAN	N/A	FTP (push)

**Exhibit 15.2. SAGE III MOC to LaRC ECS DAAC Message and Data Exchange.**

Participants and Support Requirements:

Participants:

- EGS I&T test conductor
- LaRC ECS DAAC M&O support to receive and send data
- SAGE III MOC support to send data

Communications:

- Voice: telephone
- Data: LaRC FDDI Isolation LAN  
Campus FDDI Backbone
- IP address: TBS

Equipment and Software :

- Hardware: LaRC ECS DAAC SAGE III server  
node name: 17xsagesvr1.larc.nasa.gov  
level 0 directory: /level\_0/sage
- Software: ECS Ingest Subsystem

Test Tools:

TBD

Test Data:

Description/Characteristics	Source	File/Script & Location
Level 0 PDR1	SAGE III MOC	sage3m3_lzd_yyyymmddd_hh_mm_vx.xx_cxx_type.pdr
Level 0 Metadata	SAGE III MOC	sage3m3_lzm_yyyymmdd_vx.xx_cxx_type
Level 0 Construction Record	SAGE III MOC	sage3m3_lzc_yyyymmdd_vx.xx_cxx_type
Level 0 Data	SAGE III MOC	sage3m3_lzd_yyyymmdd_vx.xx_cxx_type
Level 0 Ancillary	SAGE III MOC	sage3m3_lza_yyyymmdd_vx.xx_cxx_type
Level 0 PDR2	SAGE III MOC	sage3m3_lzd_yyyymmddd_hh_mm_vx.xx_cxx_type.pdr
Definitive Orbit Metadata	SAGE III MOC	sage3m3_epm_yyyymmdd_vx.xx_cxx_type
Definitive Orbit Data	SAGE III MOC	sage3m3_epd_yyyymmdd_vx.xx_cxx_type
Definitive Orbit Ancillary	SAGE III MOC	sage3m3_epa_yyyymmdd_vx.xx_cxx_type
Definitive Orbit PDR1	SAGE III MOC	sage3m3_epd_yyyymmddd_hh_mm_vx.xx_cxx_type.pdr
Definitive Orbit PDR2	SAGE III MOC	sage3m3_epd_yyyymmddd_hh_mm_vx.xx_cxx_type.pdr

<b>Description/Characteristics</b>	<b>Source</b>	<b>File/Script &amp; Location</b>
Level 0 Short PDRD	LaRC ECS DAAC	sage3m3_lzd_yyyymmddd_hh_mm_vx.xx_cxx_type.pdrd
Level 0 Long PDRD	LaRC ECS DAAC	sage3m3_lzd_yyyymmddd_hh_mm_vx.xx_cxx_type.pdrd
Definitive Orbit Short PDRD	LaRC ECS DAAC	sage3m3_epd_yyyymmddd_hh_mm_vx.xx_cxx_type.pdrd
Definitive Orbit Long PDRD	LaRC ECS DAAC	sage3m3_epd_yyyymmddd_hh_mm_vx.xx_cxx_type.pdrd
Level 0 Short PAN	LaRC ECS DAAC	sage3m3_lzd_yyyymmddd_hh_mm_vx.xx_cxx_type.pan
Level 0 Long PAN	LaRC ECS DAAC	sage3m3_lzd_yyyymmddd_hh_mm_vx.xx_cxx_type.pan
Definitive Orbit Short PAN	LaRC ECS DAAC	sage3m3_epd_yyyymmddd_hh_mm_vx.xx_cxx_type.pan
Definitive Orbit Long PAN	LaRC ECS DAAC	sage3m3_epd_yyyymmddd_hh_mm_vx.xx_cxx_type.pan

## Functional Thread Test Case

**Thread ID:** V2.0-ICT-15

**Modified:** 1/10/97

**Description:**

SAGE III MOC - LaRC DAAC Interface Confidence Test

The objective of this test is to verify the interface between the SAGE III MOC and the LaRC DAAC.

The following is a summary of the test objectives:

- Verify the SAGE III MOC can provide and the LaRC DAAC ECS can receive notification of data availability;
- Verify the SAGE III MOC can send and the LaRC ECS DAAC can receive SAGE III Level 0 data/metadata, Level 0 ancillary data/metadata, and definitive orbit data/metadata;
- Verify the SAGE III MOC can interface with the LaRC ECS DAAC and the LaRC ECS DAAC can interface with the SAGE III MOC using authorization and authentication protocol;
- Verify the LaRC ECS DAAC can provide and the SAGE III MOC can receive acknowledgment of receipt of file transfers;
- Verify the LaRC ECS DAAC capacity to support the data volumes;
- Verify the error handling capability during the course of data exchange between the SAGE III MOC and the LaRC ECS DAAC.

**Test Case ID:** V2.0-ICT-15.01

**Modified:** 1/10/97

**Description:**

Notification of Data Availability

Verify the SAGE III MOC can provide and the LaRC DAAC ECS can receive notification of data availability. Polling with Product Delivery Record is a data transfer mechanism used by the ECS Ingest Subsystem to acquire data from the SAGE III MOC. The purpose of the PDR is to announce the availability of data for transfer. Verify an FTP daemon (operator-tunable cycles) runs on the ECS side of the interface and automatically polls the SAGE III MOC server. Verify the ECS detects, using FTP-Is (list of files), a unique predefined PDR file name residing in the SAGE III MOC directory. Verify the ECS uses an FTP "get" command to acquire the detected PDR. Verify the ECS then validates the PDR. If the PDR is valid, then verify the ECS schedules to pull the data.

**Objectives:**

**Configuration:**

**Verified Requirements:**  
SAGEM0010  
SAGEM0010#B

**Data Inputs:**

**Methods for Results Analysis:**

**Assumptions/Constraints:**

Step ID	Test Station	Operator Actions/Equipment Operation:	Expected Results / Evaluation Criteria:	Comments	Verified Reqs:	Last Modified:
0.001		If Test Case passed, set STATUS to passed. All requirements are validated.			SAGEM0010, SAGEM0010#B,	2/12/97
1.001						2/12/97

**Actions Required after Program Stop/Indicated Error:**

**Procedures for Reducing/Analyzing Results:** ICT15-5

2/12/97

Functional Thread Test Case

Step ID	Test Station	Operator Actions/ Equipment	Expected Results / Evaluation	Comments	Verified	Last Modified:
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## Functional Thread Test Case

**Thread ID:** V2.0-ICT-15

**Modified:** 1/10/97

**Description:** SAGE III MOC - LaRC DAAC Interface Confidence Test

The objective of this test is to verify the interface between the SAGE III MOC and the LaRC DAAC.

The following is a summary of the test objectives:

- Verify the SAGE III MOC can provide and the LaRC DAAC ECS can receive notification of data availability;
  - Verify the SAGE III MOC can send and the LaRC ECS DAAC can receive SAGE III Level 0 data/metadata, Level 0 ancillary data/metadata, and definitive orbit data/metadata;
  - Verify the SAGE III MOC can interface with the LaRC ECS DAAC and the LaRC ECS DAAC can interface with the SAGE III MOC using authorization and authentication protocol;
  - Verify the LaRC ECS DAAC can provide and the SAGE III MOC can receive acknowledgment of receipt of file transfers;
  - Verify the LaRC ECS DAAC capacity to support the data volumes;
  - Verify the error handling capability during the course of data exchange between the SAGE III MOC and the LaRC ECS DAAC.
- SAGE III Data Exchange

**Test Case ID:** V2.0-ICT-15.02

**Modified:** 1/10/97

**Description:**

Verify the SAGE III MOC can send and the LaRC ECS DAAC can receive SAGE III Level 0 data/metadata, Level 0 ancillary data/metadata, and definitive orbit data/metadata. Using the polling method, the ECS Ingest Subsystem performs an ftp "get" to retrieve data from the SAGE III MOC.

**Objectives:**

**Configuration:**

**Verified Requirements:**  
 SAGEM0030  
 SAGEM0030#B  
 SAGEM0040  
 SAGEM0040#B  
 SAGEM0050  
 SAGEM0050#B

**Data Inputs:**

**Methods for Results Analysis:**

**Assumptions/Constraints:**

Step ID	Test Station	Operator Actions/ Equipment Operation:	Expected Results / Evaluation Criteria:	Comments	Verified Reqs:	Last Modified:
0.001		If Test Case passed, set STATUS to passed. All requirements are validated.			SAGEM0030, SAGEM0030#B, SAGEM0040, SAGEM0040#B, SAGEM0050, SAGEM0050#B.	2/12/97

1.001

2/12/97

Step ID	Test Station	Operator Actions/ Equipment	Expected Results / Evaluation	Comments	Verified	Last Modified:
						2/12/97

**Actions Required after Program Stop/Indicated Error:**

**Procedures for Reducing/Analyzing Results:**

## Functional Thread Test Case

**Thread ID:** V2.0-ICT-15

**Modified:** 1/10/97

**Description:** SAGE III MOC - LaRC DAAC Interface Confidence Test

The objective of this test is to verify the interface between the SAGE III MOC and the LaRC DAAC.

The following is a summary of the test objectives:

- Verify the SAGE III MOC can provide and the LaRC DAAC ECS can receive notification of data availability;
- Verify the SAGE III MOC can send and the LaRC ECS DAAC can receive SAGE III Level 0 data/metadata, Level 0 ancillary data/metadata, and definitive orbit data/metadata;
- Verify the SAGE III MOC can interface with the LaRC ECS DAAC and the LaRC ECS DAAC can interface with the SAGE III MOC using authorization and authentication protocol;
- Verify the LaRC ECS DAAC can provide and the SAGE III MOC can receive acknowledgment of receipt of file transfers;
- Verify the LaRC ECS DAAC capacity to support the data volumes;
- Verify the error handling capability during the course of data exchange between the SAGE III MOC and the LaRC ECS DAAC.

**Test Case ID:** V2.0-ICT-15.03

**Modified:** 1/10/97

**Description:** Authorization and Authentication Protocol

Verify the SAGE III MOC can interface with the LaRC ECS DAAC and the LaRC ECS DAAC can interface with the SAGE III MOC using authorization and authentication protocol. The ECS system has been determined to be Sensitivity Level 2. The SAGE III MOC uses kerberos or DCE authentication when writing to the LaRC ECS archive. The LaRC ECS DAAC uses ftp (kftp preferred) when polling the SAGE III MOC disk.

**Objectives:**

**Configuration:**

**Verified Requirements:**  
 SAGEM1010  
 SAGEM1010#B  
 SAGEM1020  
 SAGEM1020#B

**Data Inputs:**

**Methods for Results Analysis:**

**Assumptions/Constraints:**

Step ID	Test Station	Operator Actions/Equipment Operation:	Expected Results / Evaluation Criteria:	Comments	Verified	Last Modified:
0.001		If Test Case passed, set STATUS to passed. All requirements are validated.			SAGEM1010, SAGEM1010#B, SAGEM1020, SAGEM1020#B.	2/12/97

1.001

2/12/97

2/12/97

Functional Thread Test Case

Step ID	Test Station	Operator Actions/ Equipment	Expected Results / Evaluation	Comments	Verified	Last Modified:
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Actions Required after Program  
Stop/Indicated Error:

Procedures for Reducing/Analyzing  
Results:

## Functional Thread Test Case

**Thread ID:** V2.0-ICT-15

**Modified:** 1/10/97

**Description:** SAGE III MOC - LaRC DAAC Interface Confidence Test

The objective of this test is to verify the interface between the SAGE III MOC and the LaRC DAAC.

The following is a summary of the test objectives:

- Verify the SAGE III MOC can provide and the LaRC DAAC ECS can receive notification of data availability;
- Verify the SAGE III MOC can send and the LaRC ECS DAAC can receive SAGE III Level 0 data/metadata, Level 0 ancillary data/metadata, and definitive orbit data/metadata;
- Verify the SAGE III MOC can interface with the LaRC ECS DAAC and the LaRC ECS DAAC can interface with the SAGE III MOC using authorization and authentication protocol;
- Verify the LaRC ECS DAAC can provide and the SAGE III MOC can receive acknowledgment of receipt of file transfers;
- Verify the LaRC ECS DAAC capacity to support the data volumes;
- Verify the error handling capability during the course of data exchange between the SAGE III MOC and the LaRC ECS DAAC.

**Test Case ID:** V2.0-ICT-15.04

**Modified:** 1/10/97

**Description:** Acknowledgment of Receipt of File Transfers

Verify the LaRC ECS DAAC can provide and the SAGE III MOC can receive acknowledgment of receipt of file transfers. Verify the ECS automatically returns a PDRD to the SAGE III MOC in the event of an invalid PDR. There are two types of PDRD messages; a short and a long PDRD. Verify the ECS automatically returns a PAN to the SAGE III MOC indicating a successful or unsuccessful ingest and archival of data. The PAN signifies completion of data transfer (ingest) and archival, and identifies any errors or problems that occurred. There are two types of PAN messages; a short and long PAN.

**Objectives:**

**Configuration:**

**Verified Requirements:**  
SAGEM0020  
SAGEM0020#B

**Data Inputs:**

**Methods for Results Analysis:**

**Assumptions/Constraints:**

Step ID	Test Station	Operator Actions/Equipment Operation:	Expected Results/Evaluation Criteria:	Comments	Verified Reqs:	Last Modified:
0.001			If Test Case passed, set STATUS to passed. All requirements are validated.		SAGEM0020, SAGEM0020#B,	2/12/97
1.001						2/12/97

**Actions Required after Program Stop/Indicated Error:**

**Procedures for Reducing/Analyzing Results:**

## Functional Thread Test Case

**Thread ID:** V2.0-ICT-15

**Modified:** 1/10/97

**Description:**

SAGE III MOC - LaRC DAAC Interface Confidence Test

The objective of this test is to verify the interface between the SAGE III MOC and the LaRC DAAC.

The following is a summary of the test objectives:

- Verify the SAGE III MOC can provide and the LaRC DAAC ECS can receive notification of data availability;
  - Verify the SAGE III MOC can send and the LaRC ECS DAAC can receive SAGE III Level 0 data/metadata, Level 0 ancillary data/metadata, and definitive orbit data/metadata;
  - Verify the SAGE III MOC can interface with the LaRC ECS DAAC and the LaRC ECS DAAC can interface with the SAGE III MOC using authorization and authentication protocol;
  - Verify the LaRC ECS DAAC can provide and the SAGE III MOC can receive acknowledgment of receipt of file transfers;
  - Verify the LaRC ECS DAAC capacity to support the data volumes;
  - Verify the error handling capability during the course of data exchange between the SAGE III MOC and the LaRC ECS DAAC.
- Support the Data Volumes

**Test Case ID:** V2.0-ICT-15.05

**Modified:** 1/10/97

**Description:**

Verify the LaRC ECS DAAC capacity to support the data volumes. Verify Level 0 data/metadata and Level 0 ancillary data/metadata 125 MB/day support capacity. Verify definitive orbit data/metadata 5 MB/day support capacity.

**Objectives:**

**Configuration:**

**Verified Requirements:**  
SAGEM2010  
SAGEM2010#B

**Data Inputs:**

**Methods for Results Analysis:**

**Assumptions/Constraints:**

Step ID	Test Station	Operator Actions/ Equipment Operation:	Expected Results / Evaluation Criteria:	Comments	Verified Reqs:	Last Modified:
0.001		If Test Case passed, set STATUS to passed. All requirements are validated.			SAGEM2010, SAGEM2010#B.	2/12/97
1.001						2/12/97

**Actions Required after Program Stop/Indicated Error:**

**Procedures for Reducing/Analyzing Results:**

## Functional Thread Test Case

**Thread ID:** V2.0-ICT-15

**Modified:** 1/10/97

**Description:**

SAGE III MOC - LaRC DAAC Interface Confidence Test

The objective of this test is to verify the interface between the SAGE III MOC and the LaRC DAAC.

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- Verify the SAGE III MOC can provide and the LaRC DAAC ECS can receive notification of data availability;
  - Verify the SAGE III MOC can send and the LaRC ECS DAAC can receive SAGE III Level 0 data/metadata, Level 0 ancillary data/metadata, and definitive orbit data/metadata;
  - Verify the SAGE III MOC can interface with the LaRC ECS DAAC and the LaRC ECS DAAC can interface with the SAGE III MOC using authorization and authentication protocol;
  - Verify the LaRC ECS DAAC can provide and the SAGE III MOC can receive acknowledgment of receipt of file transfers;
  - Verify the LaRC ECS DAAC capacity to support the data volumes;
  - Verify the error handling capability during the course of data exchange between the SAGE III MOC and the LaRC ECS DAAC.
- Error Handling during Data Exchange

**Test Case ID:** V2.0-ICT-15.06

**Modified:** 11/25/96

**Description:**

Verify the error handling capability during the course of data exchange between the SAGE III MOC and the LaRC DAAC ECS.

**Objectives:**

**Configuration:**

**Verified Requirements:**

**Data Inputs:**

**Methods for Results Analysis:**

**Assumptions/Constraints:**

Step ID	Test Station	Operator Actions/Equipment Operation:	Expected Results / Evaluation Criteria:	Comments	Verified Reqs:	Last Modified:
1.001		TBS				2/12/97

**Actions Required after Program Stop/Indicated Error:**

**Procedures for Reducing/Analyzing Results:**